



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105**

**WASTE MANAGEMENT DIVISION  
RCRA ENFORCEMENT OFFICE  
RCRA COMPLIANCE EVALUATION INSPECTION REPORT**

**Purpose:** RCRA Compliance Evaluation Inspection

**Facility:** Space Exploration Technologies

**Location:** 1 Rocket Road, Hawthorne, CA 90250

**EPA ID Number:** CAR 000 191 536

**Date of Inspection:** July 13, 2009

**EPA Representatives:** James Polek  
RCRA Enforcement Officer  
(415) 972-3185

Kaoru Morimoto  
RCRA Enforcement Officer  
(415) 972-3306

Christopher Rollins  
RCRA Enforcement Officer  
(415) 947-4166

**Facility Representative:** Bill Woolley  
Safety Engineer  
(310) 363-6645  
(310) 363-6001 (Fax)  
[william.woolley@spacex.com](mailto:william.woolley@spacex.com)

**Report Prepared By:** James Polek

**Report Date:** August 24, 2009

## Introduction

On July 13, 2009, U.S. Environmental Protection Agency (EPA) representatives conducted an unannounced site inspection of the Space Exploration Technologies (SpaceX) facility in Hawthorne, CA. The purpose of the inspection was to determine SpaceX's compliance with applicable federal environmental statutes and regulations, and in particular, the Resource Conservation and Recovery Act (RCRA), as amended, the regulations provided in the Code of Federal Regulations (CFR), Chapter 40, Parts 261-265, 268, and 279, and the California Code Regulations (CCR), Title 22, Division 4.5 and the California Health and Safety Code, Division 20.

The inspectors conducted a physical inspection of the facility and reviewed records related to SpaceX's hazardous waste management practices. This inspection report summarizes the events that transpired during the inspection, observations made by the inspectors, and materials received by the facility after the inspection.

## Facility Background

<b>Facility Name</b>	Space Exploration Technologies
<b>Established</b>	2002; at current location since November 2007
<b>Number of Employees</b>	600
<b>Facility Size</b>	500,000 square feet
<b>Hours of Operation</b>	Portions of facility are 24/7
<b>Filed Notification of Hazardous Waste Activity</b>	April 17, 2008
<b>Facility Processes</b>	SpaceX designed and is manufacturing a launch vehicle for placing satellites into orbit and for delivering cargo to the international space station. The company is currently transitioning from a research and development company to a manufacturing company. SpaceX designed and is manufacturing the liquid-fuel rocket that powers the launch vehicle as well as the avionics throughout the vehicle.
<b>Waste Streams</b>	Waste alodine (D002, D007), waste acetone (F003), waste isopropyl alcohol and phenol (D001), waste rocket propellant (D001), paint waste (D001, F003, F005), waste resin and epoxy (D001), waste Pasa Jell (D002, D007), waste etch (D002), magnesium chips in oil (D001, D003), machine shop coolant (CA 223), waste filters (CA 352), spent lamps and batteries (universal waste)
<b>Generator Status</b>	Large Quantity Generator (LQG)
<b>Last Inspection</b>	According to EPA's RCRAInfo database, a RCRA compliance evaluation inspection has never been conducted at this SpaceX location.



## Facility Inspection

The inspectors were given a tour of the facility by Mr. Bill Woolley. The following tables summarize the areas inspected and the potential violations found in the satellite accumulation areas (SAA) and the hazardous waste storage area.

### *Area 1: Hazardous Waste Storage Area – Potential Violations*

Location	Container Type	Waste Type	Potential Violation	Photo
Hazardous Waste Storage Area	1 30-gallon container with accumulation start date (ASD) of 3/13/09	Waste acetone (D001)	Storage for >90 days; Incomplete label	1-A
	1 55-gallon container	Waste alodine (D002, D007)	Incomplete label	
	1 350-gallon tote (see comment)	Waste coolant (CA 223)	None	
	2 cubic yard boxes	Dirty floor mats and rags awaiting laundry service	None	
	1 cubic yard box	2 garbage bags of hysol glue (resin) (D001)	No ASD	
	1 cubic yard box	Machine shop filters (CA 352)	No label	
	1 55-gallon container with ASD of 4/24/08	Waste isopropyl alcohol (D001)	Storage for >90 days; Open container; Incomplete label	1-B
	1 55-gallon container with ASD of 1/20/09	Waste alodine rags (D007)	Storage for >90 days	1-C
	1 2-gallon container in flammable materials cabinet	Unknown	No label; Open container	
	1 30-gallon container	Pasa Jell acidic waste (D002, D007)	Incomplete label	1-D

	2 55-gallon containers	Waste paint lab packs (D001, F003, F005)	<b>Incomplete labels</b>	
Hazardous Waste Storage Area (cont)	3 cardboard boxes	Universal waste lamps	<b>One open box; Two boxes no label</b>	
	1 55-gallon container	Spent acidic batteries (universal waste)	<b>None</b>	
	1 30-gallon container	Spent alkaline batteries (universal waste)	<b>None</b>	
	1 30-gallon container	Paint waste (D001)	<b>None</b>	
	1 5-gallon container with ASD 11/16/08	Acid etch waste (D002)	<b>Storage for &gt;90 days</b>	<b>1-E</b>
	1 5-gallon container	Waste acid awaiting waste determination	<b>None</b>	
	1 55-gallon container	Waste rocket propellant (RP-1) (D001)	<b>No label</b>	
	1 30-gallon container	Waste aerosol cans (D001)	<b>No label</b>	

**Comments:** Liquid was present in the secondary containment of the tote, which means that the secondary containment was actually an open container of non-RCRA hazardous waste coolant (CA 223). The hazardous waste storage area lacks aisle space between containers to allow for inspection of the containers (Photos 1-F and 1-G).

#### **Area 2: Deburring Area – Potential Violations**

<b>Location</b>	<b>Container Type</b>	<b>Waste Type</b>	<b>Potential Violation</b>	<b>Photo</b>
Outside Deburring Area	1 20-gallon flammable materials container	Oily rags	<b>No label</b>	

**Comments:** The containers of oily rags throughout the facility need to have hazardous waste labels. None of the containers observed during the inspection were labeled properly.

**Area 3: PICA Lab – Potential violations**

Location	Container Type	Waste Type	Potential Violation	Photo
Inside Lab	1 20-gallon flammable materials container	Rags with PICA solution (D001)	Incomplete label	
	1 24-ounce container	Waste resin (D001)	No label; Open container	3-A
	1 5-gallon container	Glycol saturated waste (CA 223)	No label	
Outside Lab	350-gallon tote	Empty	None	

**Comments:** The tote outside the lab receives waste during production runs. The facility representative indicated that lab personnel label the tote when production begins.

**Area 4: Avionics – Potential violations**

Location	Container Type	Waste Type	Potential Violation	Photo
Avionics Area	1 14-gallon flammable materials container	Label stated “Hazardous Materials Only”	Incomplete label	4-A
	1 5-gallon flammable materials container	Label stated “FOD – Foreign Object Debris”	Incomplete label	4-A
Clean Room	1 14-gallon flammable materials container	Label stated “Hazardous Materials Only”	Incomplete label	
	1 5-gallon flammable materials container	Label stated “FOD – Foreign Object Debris”	Incomplete label	

**Comments:** The inspectors explained to the facility representative that the container labels



needed to be changed to hazardous waste labels if they indeed were used for hazardous waste. Containers throughout the facility used this labeling methodology, so the facility needs to modify labels on these containers as well, as appropriate.

**Area 5: Structures Testing – Potential Violations**

Location	Container Type	Waste Type	Potential Violation	Photo
Structures Testing Area	1 5-gallon container	Used hydraulic oil	Open Container; No label	
	1 20-gallon flammable materials container	Oily rags	No label	

**Comments:** None

**Area 6: Composite Finishing – No Violations**

Location	Container Type	Waste Type	Potential Violation	Photo
Composite Finishing	None	None	None	

**Comments:** The composite material is cured, so no hazardous waste is generated in this area.

**Area 7: Spin-Form Area – Potential Violations**

Location	Container Type	Waste Type	Potential Violation	Photo
Spin-Form Area	1 5-gallon container	Label indicated “Alodine only”	Need waste determination	7-A

**Comments:** None.

**Area 8: Machine Shop – Potential Violations**

Location	Container Type	Waste Type	Potential Violation	Photo
EDM Area	None	None	None	
Lathe and Mill Area	3 14-gallon flammable materials containers	Oily Rags	No labels; One open container	
	1-gallon pan	Cutting oil	Need waste determination	8-A
	1 5-gallon container	Spent way lube	No label	
	1 5-gallon container	Unknown	Need waste determination	

**Comments: None.**

**Record Review**

Reviewed the following records:

- Manifests from 2007 through 2009
- Land Disposal Restriction (LDR) Notifications
- Biennial Reports
- Contingency Plan
- Training Plan
- Training Records
- Inspection Log.

The 2007 manifests and LDR notifications were from Spacex's previous location and some did not have a final signed copy. Spacex did not manifest hazardous waste from their current location until 2008. No LDR notifications were available for their current location.

The 2007 Biennial Report was not prepared for the current location because Spacex was not an LQG at this location in 2007. However, Spacex is now an LQG and they will need to file a 2009 Biennial Report by March 1, 2010 for their current location.

The contingency plan needed to include arrangements with emergency responders and needed to include descriptions and locations of emergency equipment throughout the facility.

The facility had training records for Mark Drop, the employee responsible for the hazardous

waste storage area. The facility did not have a training plan that indicates employee job descriptions and training required for those employees responsible for managing hazardous waste.

The facility representative indicated that the 90-day hazardous waste storage area was inspected daily, and that the inspections were only documented quarterly.

### **Potential Violations of RCRA Hazardous Waste Requirements**

#### **1. Storage of hazardous waste without a permit 22 CCR §66270.1(c) [40 CFR §270.1(c)]. Failure to store hazardous waste for less than the 90 day limit allowed LQGs, 22 CCR §66262.34(a) [40 CFR §262.34(a)].**

##### *Requirements:*

22 CCR §66270.1(c) requires that each person owning or operating a facility where hazardous waste is transferred, treated, stored, or disposed must have a permit. However, LQGs may accumulate hazardous waste on-site for 90 days or less without a permit provided that the waste is properly contained, labeled, and managed, as defined in California regulation 22 CCR §66262.34(a).

##### *Findings:*

The following containers in the Hazardous Waste Storage Area were stored for longer than 90 days:

- One 30-gallon container of waste acetone (D001) with ASD of 3/13/09
- One 55-gallon container of waste isopropyl alcohol (D001) with ASD of 4/24/08
- One 55-gallon container of waste alodine rags (D007) with ASD of 1/20/09
- One 5-gallon container of acid etch waste (D002) with ASD 11/16/08.

##### *Facility Response:*

On July 21, 2009, Spacex emailed photographs of the Hazardous Waste Storage Area and indicated that the waste was picked up that day.

#### **2. Failure to label hazardous waste containers properly, 22 CCR §66262.34(f) [40 CFR §262.34(a)].**

##### *Requirements:*

As stated in California regulation 22 CCR §66262.34(f)(1), generators who accumulate hazardous waste on-site without a permit shall have the date accumulation begins clearly marked, and visible for inspection, on each container. As stated in California regulation 22 CCR §66262.34(f)(3), each container must also be clearly marked with the words "Hazardous Waste," and labeled with the composition and physical state of the waste, hazardous properties, and facility name and address.



*Findings:*

Labels on the containers in the Hazardous Waste Storage Area were missing or incomplete:

- One 30-gallon container of waste acetone (D001) had an incomplete hazardous waste label.
- One 55-gallon container of waste isopropyl alcohol (D001) had an incomplete hazardous waste label.
- One 55-gallon container of waste alodine (D002, D007) had an incomplete hazardous waste label.
- One 55-gallon container with two garbage bags of hysol glue (resin) (D001) had a hazardous waste label with no ASD.
- One 2-gallon container of unknown material in the flammable materials cabinet (assumed to be D001 because it is in flammable materials cabinet) did not have a hazardous waste label.
- One 30-gallon container of Pasa Jell acidic waste (D002, D007) had an incomplete label.
- Two 55-gallon containers of waste paint lab packs (D001, F003, F005) had an incomplete labels.
- One 55-gallon container of waste rocket propellant (RP-1) (D001) had no hazardous waste label.
- One 30-gallon container of waste aerosol cans (D001) had no hazardous waste label.

*Facility Response:*

On July 21, 2009, SpaceX emailed photographs of the Hazardous Waste Storage Area and indicated that waste was picked up that day. The waste remaining was properly labeled.

**3. Failure to close hazardous waste containers, 22 CCR §66265.173(a) [40 CFR §265.173(a)].**

*Requirements:*

As stated in California regulation 22 CCR §66262.34(a), generators may accumulate hazardous waste on-site for 90 days or less without a permit or grant of interim status, provided that the generator complies with the requirements in Article 9 of Chapter 15. As stated in Article 9 (22 CCR §66265.173(a)), a container holding hazardous waste shall always be closed during transfer and storage, except when it is necessary to add or remove waste.

*Findings:*

- One 55-gallon container of waste isopropyl alcohol (D001) in the Hazardous Waste Storage Area was left open.
- One 2-gallon container of unknown material in the flammable materials cabinet in the Hazardous Waste Storage Area had no lid.
- One 24-ounce container of waste resin (D001) in the PICA lab had no lid.

*Facility Response:*

On July 21, 2009, Spacex emailed a photograph of the empty flammable materials cabinet in the Hazardous Waste Storage Area and indicated that the waste was picked up that day.

**4. Failure to maintain adequate aisle space in hazardous waste storage area, 22 CCR §66265.35 [40 CFR §265.35].**

*Requirements:*

California regulation 22 CCR §66262.34(a)(4) indicates that a generator may accumulate hazardous waste on-site without a permit provided that the generator complies with the requirements in Article 3 of Chapter 15. As stated in Article 3 (22 CCR §66265.35), the owner or operator shall maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency.

*Findings:*

The lack of aisle space in the hazardous waste storage area limited the inspection of the hazardous waste containers.

*Facility Response:*

On July 21, 2009, Spacex emailed photographs of the Hazardous Waste Storage Area showing that it was organized with fewer containers than observed during the inspection and plenty of aisle space to allow for proper inspection of the containers.

**5. Failure to label hazardous waste containers in satellite accumulation area, 22 CCR §66262.34(e)(1) [40 CFR §262.34(c)(1)].**

*Requirements:*

As stated in California regulation 22 CCR §66262.34(e)(1), generators may accumulate as much as 55-gallons of hazardous waste at or near any point of generation provided that the initial date of waste accumulation is clearly marked and visible for inspection, and that the generator complies with subsection 22 CCR §66262.34(f)(3). Subsection 22 CCR §66262.34(f)(3) requires that the container be clearly marked with the words "Hazardous Waste," and the container is labeled with the composition and physical state of the waste, hazardous properties, and facility name and address.

*Findings:*

Labels on containers in the following SAAs were missing or incomplete:

- One 20-gallon flammable materials container of rags with PICA solution (D001) in the PICA lab had an incomplete hazardous waste label.
- One 24-ounce container of waste resin (D001) in the PICA lab had no hazardous waste label.
- Two 14-gallon flammable materials containers, one inside and one outside the Avionic's clean room, were labeled as "Hazardous Material Only."